

## Claims

- [c1] An integrated electronic system housing and magnet structure for an imaging system comprising:
  - a housing coupled to a magnet structure, said housing containing imaging system support electronics;
  - a radio frequency shield coupled to said housing and preventing radio frequency interference of at least one radio frequency receiver coil from said imaging system support electronics.
- [c2] A system as in claim 1 wherein said radio frequency shield is coupled within said housing.
- [c3] A system as in claim 1 wherein said imaging system support electronics is encased in said radio frequency shield.
- [c4] A system as in claim 1 wherein said radio frequency shield is coupled within said housing and encases said imaging system support electronics.
- [c5] A system as in claim 1 wherein said imaging system support electronics comprises at least one of a radio frequency amplifier, a gradient amplifier, a timing device, an oscillator, a radio frequency transmitter, a gradient

coil controller, and a sequence controller.

- [c6] A system as in claim 1 wherein said radio frequency shield comprises at least one layer.
- [c7] A system as in claim 6 wherein said at least one layer comprises:
  - a first layer; and
  - a second layer coupled to said first layer;
  - said first layer and said second layer having capacitance therebetween.
- [c8] A system as in claim 1 wherein said radio frequency shield is metallic.
- [c9] A system as in claim 1 wherein said radio frequency shield is a conductive mesh.
- [c10] A system as in claim 1 wherein said radio frequency shield is a superconductor.
- [c11] A system as in claim 1 wherein said radio frequency shield comprises at least one void.
- [c12] A system as in claim 1 wherein said radio frequency shield reflects radio frequencies.
- [c13] An imaging system comprising:
  - a magnet structure generating at least one magnetic

field;  
a first housing coupled to said magnet structure and having imaging system support electronics; and a radio frequency shield coupled to said housing and preventing radio frequency interference between said at least one radio frequency receiver coil and said imaging system support electronics.

- [c14] An imaging system as in claim 13 further comprising a second housing containing said magnet structure, wherein said first housing and said second housing are integrally formed as a single housing.
- [c15] A system as in claim 13 wherein said imaging system support electronics is encased in said radio frequency shield.
- [c16] A system as in claim 13 wherein said radio frequency shield is coupled within said housing and encases said imaging system support electronics.
- [c17] A system as in claim 13 wherein said radio frequency shield comprises at least one layer.
- [c18] A system as in claim 17 wherein said at least one layer comprises:
  - a first layer; and
  - a second layer coupled to said first layer;

said first layer and said second layer having capacitance therebetween.

- [c19] A system as in claim 13 wherein said radio frequency shield is metallic.
- [c20] A system as in claim 13 wherein said radio frequency shield is a conductive mesh.
- [c21] A system as in claim 13 wherein said radio frequency shield is a superconductor.
- [c22] An imaging system comprising:
  - a first housing having imaging system support electronics;
  - a second housing integrally formed with said first housing and containing a magnet structure that generates at least one magnetic field; and
  - a radio frequency shield coupled within said first housing, encasing said imaging system support electronics, and preventing radio frequency interference between said imaging system support electronics and said at least one radio frequency receiver coil.